

REMARKS

Claims 1-34 remain pending in the application.

The Applicants respectfully request the Examiner to reconsider earlier rejections in light of the following remarks. No new issues are raised nor is further search required as a result of the changes made herein. Entry of the Amendment is respectfully requested.

Claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33 over Yeap

In the Office Action, claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33 were rejected under 35 U.S.C. §102(e) as allegedly being anticipated by Yeap et al., U.S. Patent No. 6,052,420 ("Yeap"). The Applicants respectfully traverse the rejection.

Claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33 recite a method and apparatus to cancel an AM interference signal by detecting the AM interference with an antenna before the AM interference reaches a hybrid.

Yeap appears to disclose a noise suppression circuit for a two-wire communications channel (Abstract). Common mode noise is estimated by adding an in-phase TIP signal and an anti-phase RING signal in a twisted pair cable with respect to ground reference (Yeap, col. 6, lines 7-9). Within a noise estimator, the common mode signal is filtered in an adjustable bandpass filter band and phase inverted by an adjustable inverter unit (Yeap, col. 6, lines 16-18). The control unit controls an adjustable gain unit so as to adjust the amplitude of the noise estimate signal to an approximate level to cancel the differential mode noise in the differential mode signal (Yeap, col. 6, lines 46-49). A hybrid outputs a differential mode signal to a summer, the summer summing the differential mode signal with the noise estimate signal to cancel the differential mode noise (Yeap, Fig. 2).

Yeap discloses a method and apparatus to detect AM interference on a subscriber loop with a noise estimator and subsequently filtered the noise by adjusting a bandpass filter. Once the amount of interference is determined on the subscriber loop, a noise estimator determines the amount of correction to

apply to the subscriber loop to correct the interference. Thus, Yeap determines determining the amount of interference from analyzing the amount of noise on the subscriber loop. Yeap mentions an antenna once within the patent related to Fig. 1. However, the antenna 16 is disclosed as representing the source of AM interference that is injected into the subscriber loop.

In contrast to Yeap, Applicants determine the amount of AM interference before the AM interference reaches a hybrid through use of an antenna, as recited by claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33.

A benefit of detecting AM interference with an antenna before the AM interference reaches a hybrid is, e.g., eliminating delay associated with interference cancellation. Yeap determines the amount of AM interference within a subscriber loop. A determination is then made of how to handle the interference, i.e., how to adjust an adjustable bandpass filter to eliminate the interference. All of this must be done at a rate to minimize delay within the high speed data path. In contrast, Applicants determine the interference by using an antenna before the AM interference reaches a hybrid. Applicants therefore can determine the amount of interference before it actually shows up on the subscriber loop. As Applicants disclosed in the specification, this is possible because of the fact that AM radio waves travel faster through the air than they do through a ADSL subscriber line. With the amount of interference known before is reaches a hybrid, the interference can be corrected much quicker than the prior art's method of correcting AM interference by analyzing the subscriber loop.

Accordingly, for at least all the above reasons, claims 1, 3-5, 10, 12-14, 20-23, 25, 32 and 33 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Claims 2, 11 and 24 over Yeap in view of Bingel

In the Office Action, claims 2, 11 and 24 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Yeap in view of Bingel et al., U.S. Patent No. 6,173,021 ("Bingel"). The Applicants respectfully traverse the rejection.

Claims 2, 11 and 24 are dependent on claims 1, 10 and 20 respectively, and are allowable for at least the same reasons as claims 1, 10 and 20.

Claims 2, 11 and 24 recite a method and apparatus to cancel an AM interference signal by detecting the AM interference with an antenna before the AM interference reaches a hybrid.

As discussed above, Yeap fails to disclose a method and apparatus to cancel an AM interference signal by detecting the AM interference with an antenna before the AM interference reaches a hybrid, as recited by claims 2, 11 and 24.

The Office Action relies on Bingel to allegedly make up for the deficiencies in Yeap to arrive at the claimed invention. The Applicants respectfully disagree.

Bingel discloses a method and apparatus for eliminating or reducing local area and broad area interference in a twisted pair transmission pair (Abstract). A differential receiver within a DSL modem or other data communication device receives an analog signal from the twisted pair transmission line (Bingel, Fig. 1; col. 3, lines 36-53). An adder sums the output of the differential receiver and the output of a sampling scaling device to cancel interference (Bingel, Fig. 1; col. 3, lines 43-53).

Bingel discloses summing an output of a differential receiver and a sampling scaling device to reduce interference. Bingel's invention fails to disclose or suggest a hybrid circuit connected to a noise cancellation circuit, much less a method and apparatus to cancel an AM interference signal by detecting the AM interference received with an antenna before the AM interference reaches a hybrid, as recited by claims 2, 11 and 24.

Moreover, if Yeap and Bingel were an obvious combination (which they are not), the theoretical combination would still result in an interference cancellation system for a digital subscriber line that determines the amount of AM interference in a subscriber loop by analyzing the signal on the subscriber loop.

Neither Yeap nor Bingel, either alone or in combination, disclose, teach or suggest a method and apparatus to cancel an AM interference signal by detecting the AM interference with an antenna before the AM interference reaches a hybrid, as recited by claims 2, 11 and 24.

Accordingly, for at least all the above reasons, claims 2, 11 and 24 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Claims 6, 15, 19, 30 and 31 over Yeap in view of Bingel and Srinivasagopalan

In the Office Action, claims 6, 15, 19, 30 and 31 were rejected under 35 U.S.C. §103(a) as allegedly being obvious over Yeap in view of Bingel, and further in view of Srinivasagopalan et al., U.S. Patent No. 4,689,804 ("Bingel"). The Applicants respectfully traverse the rejection.

Claims 6, 15, 19, 30 and 31 are dependent on claims 1, 10 and 20 respectively, and are allowable for at least the same reasons as claims 1, 10 and 20.

Claims 6, 15, 19, 30 and 31 recite a method and apparatus to cancel an AM interference signal by detecting the AM interference with an antenna before the AM interference reaches a hybrid.

As discussed above, neither Yeap nor Bingel disclose or suggest a method and apparatus to cancel an AM interference signal by detecting the AM interference with an antenna before the AM interference reaches a hybrid, as recited by claims 6, 15, 19, 30 and 31.

The Office Action relies on Srinivasagopalan to allegedly make up for the deficiencies in Yeap and Bingel to arrive at the claimed invention. The Applicants respectfully disagree.

Srinivasagopalan appears to disclose an apparatus for cancellation of sinusoidal varying phase jitter in a data modem (Abstract). An estimate of the frequency and phase of the phase jitter is computed in a first and second stage (Srinivasagopalan, Abstract). These estimates are combined to form a composite estimate of the phase jitter that are used to cancel out the sinusoidal phase jitter in a demodulator (Srinivasagopalan, Abstract).

Srinivasagopalan discloses reducing phase jitter in a conventional PBX data transmission, **NOT** a digital subscriber line. The Office Action alleges that Srinivasagopalan discloses locking onto a sinusoidal noise source, allegedly an AM carrier interference signal (Office Action, page 9). However, AM interference only becomes prevalent in a PBX transmission medium when frequencies reach DSL proportions. Since AM interference is **NOT** a problem with conventional PBX data transmissions using conventional modems, Srinivasagopalan fails to disclose or suggest noise cancellation for a digital subscriber line, and therefore is non-analogous art with no suggestion of canceling AM interference in a digital subscriber line.

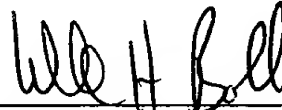
Neither Yeap, Bingel nor Srinivasagopalan, either alone or in combination, disclose, teach or suggest a method and apparatus to cancel an AM interference signal by detecting the AM interference with an antenna before the AM interference reaches a hybrid, as recited by claims 6, 15, 19, 30 and 31.

Accordingly, for at least all the above reasons, claims 6, 15, 19, 30 and 31 are patentable over the prior art of record. It is therefore respectfully requested that the rejection be withdrawn.

Conclusion

All objections and rejections having been addressed, it is respectfully submitted that the subject application is in condition for allowance and a Notice to that effect is earnestly solicited.

Respectfully submitted,
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A handwritten signature in black ink, appearing to read 'William H. Bollman', written over a horizontal line.

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